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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/701,539	11/05/2003	Timothy J. Mousley	PHB 34,266B	8211

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EXAMINER

TORRES, JOSEPH D

ART UNIT	PAPER NUMBER
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2133

DATE MAILED: 02/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/701,539

Applicant(s)

MOULSLEY, TIMOTHY J.

Examiner

Joseph D. Torres

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 November 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,4,6 and 11-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,4,6 and 11-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 November 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/348,958.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. In view of the amendment filed 11/24/2004, all objections to the drawings are withdrawn.

Claim Objections

2. In view of the amendment filed 11/24/2004, all objections to the claims in the previous Office Action are withdrawn.

Claim 15 is not a complete sentence.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 11 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 11 is incomprehensible. In particular, it is not clear what "corresponding bits" refers to and how any correspondence of interleaved words to the matrix or matching pattern exists.

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4. Claims 11 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. It is not clear what “corresponding bits” refers to and how any correspondence of interleaved words to the matrix or matching pattern exists.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

5. Claims 1, 3, 12-16 and 25 are rejected under 35 U.S.C. 102(a) as being anticipated by the 3GPP document (3rd Generation Partnership Project (3GPP); Technical Specification Group (TSG) Radio Access Network (RAN); Working Group 1 (WG1); Multiplexing and channel coding (FDD), TS 25.212 V1.0.0 (1999-04)).

35 U.S.C. 102(a) rejection of claims 1 and 25.

3GPP document teaches a coding circuit configured to generate a coded output from a digital input (see Channel coding device in Figure 4-1 on page 9 of the 3GPP document); an interleaving circuit configured to generate a plurality of interleaved words from said coded output (see 1st interleaving device in Figure 4-1 on page 9 of the 3GPP document); and a rate matching circuit for adjusting the number of bits in a data block

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comprising said plurality of interleaved words, the coded output having a greater number of bits than the digital input, the rate matching circuit having means for adjusting the number of bits in the data block using a rate matching pattern to provide data bits for transmission during respective frames of a transmission channel (see Rate matching device in Figure 4-1 on page 9 of the 3GPP document), and means for selecting the rate matching pattern depending on an associated bit deletion or repetition pattern (see Rate matching section on page 19 of the 3GPP document) that is selected to ensure that deleted or repeated bits of the data block are not required to enable all bits from the digital input to be reconstructed (the Rate matching section on page 19 of the 3GPP document emphasizes quality of transmission requirements, which can only be achieved by ensuring none of the required bits for error correction coding are lost, that is by ensuring sufficient bits to reconstruct the original data exist at the decoder).

35 U.S.C. 102(a) rejection of claim 3.

Separate rate matching units are provided for each sub-block of a parallel input stream in Figure 4-1 on page 9 of the 3GPP document.

35 U.S.C. 102(a) rejection of claim 12.

The convolutional encoder on page 12 in the 3GPP document encompasses fixed rate encoders.

35 U.S.C. 102(b) rejection of claims 13-15.

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The Interrelaver in the 3GPP document is not adaptive and any interleaver inherently has a constant bit rate.

35 U.S.C. 102(a) rejection of claim 16.

See Rate matching section on page 19 of the 3GPP document.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
6. Claims 4, 6, 17, 19 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over the 3GPP document (3rd Generation Partnership Project (3GPP); Technical Specification Group (TSG) Radio Access Network (RAN); Working Group 1 (WG1); Multiplexing and channel coding (FDD), TS 25.212 V1.0.0 (1999-04)) in view of Okumura et al. (Okumura, Y.; Adachi, F.; Variable rate transmission and blind

rate detection for coherent DS-CDMA mobile radio, Electronics Letters, Volume: 33, Issue: 24, 20 Nov. 1997, Pages: 2026 – 2027, hereafter referred to as Okumura).

35 U.S.C. 103(a) rejection of claim 4.

The 3GPP document substantially teaches the claimed invention described in claims 1 and 3 (as rejected above).

However the 3GPP document does not explicitly teach the specific use of selecting the rate matching pattern as a function of interleaver depth.

Okumura, in an analogous art, teaches use of selecting the rate matching pattern as a function of interleaver depth (Figure 2 of Okumura teaches that the frame structure is determined by the slot length of the interleaver).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the 3GPP document with the teachings of Okumura by including use of selecting the rate matching pattern as a function of interleaver depth.

This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of selecting the rate matching pattern as a function of interleaver depth would have provided the opportunity to match interleaved data rates to channel rates.

35 U.S.C. 103(a) rejection of claims 6, 17 and 19.

3GPP document teaches a coding circuit configured to generate a coded output from a digital input (see Channel coding device in Figure 4-1 on page 9 of the 3GPP

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document); an interleaving circuit configured to generate a plurality of interleaved words from said coded output (see 1st interleaving device in Figure 4-1 on page 9 of the 3GPP document); and a rate matching circuit for adjusting the number of bits in a data block comprising said plurality of interleaved words, the coded output having a greater number of bits than the digital input, the rate matching circuit having means for adjusting the number of bits in the data block using a rate matching pattern to provide data bits for transmission during respective frames of a transmission channel (see Rate matching device in Figure 4-1 on page 9 of the 3GPP document), and means for selecting the rate matching pattern depending on an associated bit deletion or repetition pattern (see Rate matching section on page 19 of the 3GPP document) that is selected to ensure that deleted or repeated bits of the data block are not required to enable all bits from the digital input to be reconstructed (the Rate matching section on page 19 of the 3GPP document emphasizes quality of transmission requirements, which can only be achieved by ensuring none of the required bits for error correction coding are lost, that is by ensuring sufficient bits to reconstruct the original data exist at the decoder). However the 3GPP document does not explicitly teach the specific use of decoding after transmission.

Okumura, in an analogous art, teaches use of decoding after transmission (Note: the Receiver in Figure 1 of Okumura is a decoding device for decoding a signal coded by a coding device having a rate matching device for adjusting the number of bits in a data block the data block comprising a plurality of interleaved words generated by the action

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of an interleaving circuit on a coded output generated by the action of a coding circuit on a digital input).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the 3GPP document with the teachings of Okumura by including use of decoding after transmission. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of decoding after transmission would have provided the opportunity to decode received data.

35 U.S.C. 103(a) rejection of claim 24.

The 3GPP document and Okumura substantially teaches the claimed invention described in claims 1-20 (as rejected above).

However the 3GPP document and Okumura does not explicitly teach the specific use of filling a matrix row-by-row and then reading column-by-column.

The Examiner asserts that the 3GPP document and Okumura teaches a matrix interleaver but does not teach the interleaving algorithm. The Examiner asserts that it would be obvious to use one of the most commonly known algorithms in the art for interleaving data based on the simplicity of the algorithm and ease of implementation. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of the 3GPP document and Okumura by including use of filling a matrix row-by-row and then reading column-by-column. This modification would have been obvious to one of ordinary skill in the art, at the time the

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invention was made, because one of ordinary skill in the art would have recognized that use of filling a matrix row-by-row and then reading column-by-column would have provided the opportunity to use one of the most commonly known algorithms in the art for interleaving data based on the simplicity of the algorithm and ease of implementation.

7. Claims 11, 18, 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over the 3GPP document (3rd Generation Partnership Project (3GPP); Technical Specification Group (TSG) Radio Access Network (RAN); Working Group 1 (WG1); Multiplexing and channel coding (FDD), TS 25.212 V1.0.0 (1999-04)) and Okumura et al. (Okumura, Y.; Adachi, F.; Variable rate transmission and blind rate detection for coherent DS-CDMA mobile radio, Electronics Letters, Volume: 33, Issue: 24, 20 Nov. 1997, Pages: 2026 – 2027, hereafter referred to as Okumura) in view of Yi; Byung Kwan (US 5978365 A).

35 U.S.C. 103(a) rejection of claims 11, 18 and 20-23.

The 3GPP document and Okumura substantially teaches the claimed invention described in claim 1 (as rejected above).

However the 3GPP document and Okumura do not explicitly teach the specific use of a puncturing matrix.

Yi, in an analogous art, teaches use of a puncturing matrix (see Figure 15 in Yi).

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Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the 3GPP document and Okumura with the teachings of Yi by including use of a puncturing matrix. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of a puncturing matrix would have provided the opportunity to puncture data for a rate-matching scheme.

8. Claims 26-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over the 3GPP document (3rd Generation Partnership Project (3GPP); Technical Specification Group (TSG) Radio Access Network (RAN); Working Group 1 (WG1); Multiplexing and channel coding (FDD), TS 25.212 V1.0.0 (1999-04)) in view of Yi; Byung Kwan (US 5978365 A).

35 U.S.C. 103(a) rejection of claims 26-29.

The 3GPP document substantially teaches the claimed invention described in claim 1 (as rejected above).

However the 3GPP document do not explicitly teach the specific use of a puncturing matrix.

Yi, in an analogous art, teaches use of a puncturing matrix (see Figure 15 in Yi).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the 3GPP document with the teachings of Yi by including use of a puncturing matrix. This modification would have been obvious to one of

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ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of a puncturing matrix would have provided the opportunity to puncture data for a rate-matching scheme.

9. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over the 3GPP document (3rd Generation Partnership Project (3GPP); Technical Specification Group (TSG) Radio Access Network (RAN); Working Group 1 (WG1); Multiplexing and channel coding (FDD), TS 25.212 V1.0.0 (1999-04)).

35 U.S.C. 103(a) rejection of claim 30.

The 3GPP document substantially teaches the claimed invention described in claims 1-20 (as rejected above).

However the 3GPP document does not explicitly teach the specific use of filling a matrix row-by-row and then reading column-by-column.

The Examiner asserts that the 3GPP document teaches a matrix interleaver but does not teach the interleaving algorithm. The Examiner asserts that it would be obvious to use one of the most commonly known algorithms in the art for interleaving data based on the simplicity of the algorithm and ease of implementation.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of the 3GPP document by including use of filling a matrix row-by-row and then reading column-by-column. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made,

because one of ordinary skill in the art would have recognized that use of filling a matrix row-by-row and then reading column-by-column would have provided the opportunity to use one of the most commonly known algorithms in the art for interleaving data based on the simplicity of the algorithm and ease of implementation.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph D. Torres whose telephone number is (571) 272-3829. The examiner can normally be reached on M-F 8-5.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (571) 272-3819. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Joseph D. Torres, PhD
Primary Examiner
Art Unit 2133

